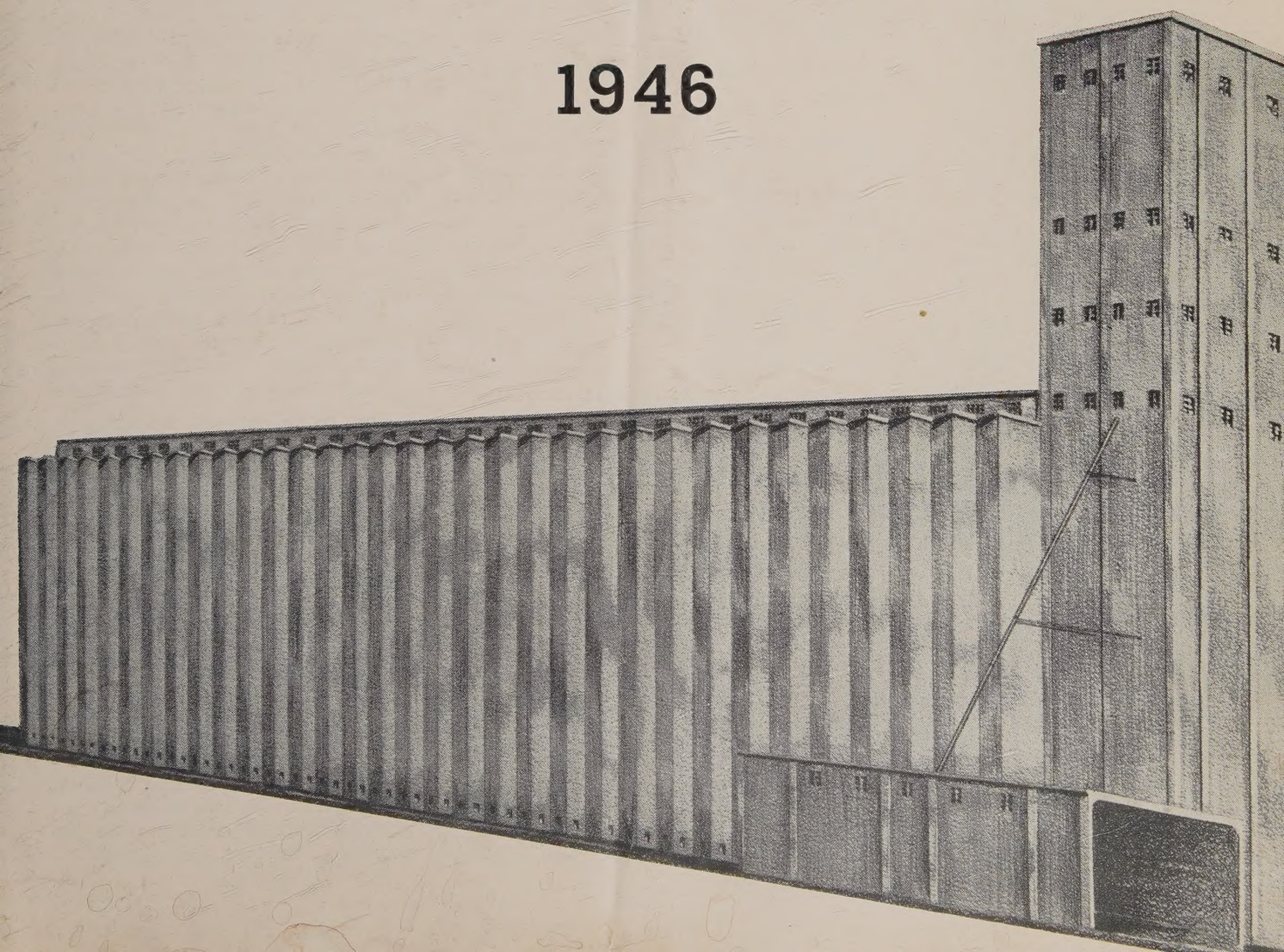
Grain

MARCH

1946



WHEAT VARIETIES AS GRADING FACTORS

There is a good chance that in the forthcoming revision of the federal grain standards, varietal grading will be established. Just how this will be accomplished remains to be seen, but it could be done by abolishing the present system of sub-classes and then creating two new sub-classes—one for wheats that have inferior milling and baking characteristics, and the other to include the other wheats in each main class. The weight of opinion is that something of this sort may be done.

Varietal grading is not new, as it has been used for years in connection with the Humpback variety of spring wheat. For a long time it has been argued by some grain inspectors and others that the principle could not be applied to other undesirable wheats, but that idea has been rendered untenable by the perfection of methods of identifying wheat varieties. These methods have come into commercial use only the past couple of years, but they have proved to be practical and dependable. Large quantities of wheat were handled last year upon the basis not only of grade but also of variety within the grade. As the federal grades are intended primarily to follow commercial usage of wheat, it is logical to expect that they will be modified to reflect this new practice.

Our understanding is that the first scientific job of wheat variety identification was done a few years ago by Fred Dines, then employed by the Texas Wheat Improvement Association. It was his work which opened the door to the methods now commonly used, and the commercial employment of these methods is making it possible for varietal grading to be considered in the federal standards.

Once the inferior milling variety is tagged so that it will have to sell on its merits all the way from the mill back to the farm, it is inevitable that the production of such wheats will decline sharply. This may very well prove to be a program with far-reaching results.—Millers' National Federation.

NEW ELECTRIC CODE OUT

A new edition of the National Electrical Code is now available. Due to changes therein it will become necessary to revise some of the N.F.P.A. dust explosion hazards codes to comply therewith. Changes will be announced as received.

SUPERINTENDENTS' PROGRAM

Annual Convention Agenda Packed Full to the Brim
Cedar Rapids Mecca of Progress, May 23-24-25
Supers From Far and Wide Contribute to Program

WEDNESDAY EVENING

Registration, Hotel Roosevelt.

Committee Meetings: Auditing, Dust Explosions, Safety, Etc.

Directors Meeting.

THURSDAY MORNING

Registration, Hotel Roosevelt.

DUST EXPLOSION SESSION

Presiding: Herbert C. Brand, The Quaker Oats Co., Cedar Rapids.

Call to Order—President Brand.

Welcome to Cedar Rapids—Arthur Poe, Manager, The Quaker Oats Co., Cedar Rapids.

We're Glad to Be Here—R. B. Pow, Reliance Grain Co., Ltd., Fort William.

My Stewardship—Pres. Herbert C. Brand.

Standing Tribute to the Memory of Departed Members.

The State of the Treasury—Dean M. Clark, Chicago.

Let's Put Explosions Under the Scientists' Microscope: Some Recent Findings—Lloyd G. Howe, North American Companies, Toronto.

Observations on Recent Dust Explosions—John Belanger, Manitoba Pool Elevators, Ltd., Port Arthur; John H. Irwin, Western Grain Co., Ltd., Fort William, and Frank E. Carlson, Underwriters Grain Association, Chicago.

Discussion:

Are You Taking Full Advantage of the New N. F. P. A. Code on Suction and Venting?—John Hommes, for Kent Parker, N. F. P. A. Sub-Committee Chairman, Western Actuarial Bureau, Chicago.

Discussion:

Magnetic Separator Protection Against Sparks from Tramp Iron—William Gassler, Rosenbaum Brothers, Chicago.

Discussion:

Spout Magnetic Experiments—Harry Hansen, The Glidden Co., Chicago.

Discussion:

Other Explosion Preventatives: Non-Sparking Sounding Lines, Correct Bin Inspection Lamps, Electrical Equipment Recommendations, Outside Dust Bins, Rubbish and Waste and Matches Containers, Fire Barrels, Extinguishers and Fire Fighting Equipment, Fire Escapes, Etc.; Plant Maintenance and Dust Explosions—Frank E. Carlson, Engineer, Underwriter Grain Association, Chicago.

Committee Appointments—Nominations, Resolutions, New Membership, Name Change, Program for 1947.

THURSDAY LUNCHEON

Presiding: Charles J. Winters, Public Grain Elevators, New Orleans.

The Features of Our Corn Elevator, with Emphasis on the Innovations in Our Dust Control System—B. E. Bochmann, Chief Engineer, Penick & Ford, Ltd., Cedar Rapids.

Tour of the Penick & Ford Plant.

Presiding: Harold C. Wilber, A. E. Staley Mfg. Co., Decatur, Ill.

Conditions at Depths in Grain Bins (A Thought Provoker)—Dr. B. N. Smallman, Stored Products Investigations, Science Service, Division of Entomology, Department of Agriculture, Winnipeg.

PANEL SESSION

Elevating and Conveying Panel Discussions—Chairman Paul Naeher, B. F. Gump Co., Chicago; Panel Members—J. C. Perry, Fort William Elevator Co., Ltd., Fort William; Charles J. Winters, Public Grain Elevator, New Orleans; Walter Teppen, Occidental Terminal Division, Russell-Miller Milling Co., Duluth; Lewis Inks, The Quaker Oats Co., Akron, and Russell B. Maas, Screw Conveyor Co., Hammond, Ind.

Cleaning, Grading, Mixing, Binning and Storage Panel Discussion—Chairman, Clifford A. MacIver, Archer-Daniels-Midland Co., Minneapolis; Panel Members: Herbert C. Brand, The Quaker Oats Co., Cedar Rapids; L. S. Hover, Thomson Grain Elevator Co., Louisville; Dewey Hagman, Archer-Daniels-Midland Co., Minneapolis; Percy C. Poulton, N. M. Paterson & Co., Ltd., Fort William, and H. L. Heinrikson, Terminal Grain Corp., Sioux City, Ia.

Drying: Preparing High Moisture Grains for Safe Storage: Taking Care of "Hot Spots" Panel Discussion—Chairman, Harold C. Wilber, A. E. Staley Mfg. Co., Decatur; Panel Members—Vincent Blum, Omaha Elevator Co., Omaha; Harry Hansen, The Glidden Co., Chicago; Herman Peterson, Van Dusen-Harrington Co., Minneapolis; John T. Goetzinger. Rosenbaum Brothers, Omaha, and E. R. Anderson, Norris Grain Co., Chicago.

Presiding: Fred A. Sibbald, National Grain Co., Ltd., Fort William.

Weighing and Moisture Testing Panel Discussion—Chairman Ward Stanley, Standard Milling Co., Kansas City; Panel Members—John Belanger, Manitoba Pool Elevators, Ltd., Port Arthur; Fred Keeney, Allied Mills, Inc., Portsmouth, Va.; Robert M. Lare, Butler-Welsh Grain Co., Nebraska City, Neb.; Henry Bowman, G. J. Meyer Malt & Grain Corp., Buffalo, and W. J. Hooper, Farmers Grain Co-Operative, Ogden, Utah.

Power and Transmission Panel Discussion: Chairman, Grover C. Meyer, Kansas City (Mo.) Power & Light Co.; Panel Members—Leonard Danielson, Arcady Farms Milling Co., Chicago; Clifford C. Steiner, Central Soya Co., Decatur, Ind.; Arthur J. J. Meyer, Mc-

Cabe Bros. Grain Co., Ltd., Fort William; John Andrews, Northland Machinery & Supply Co., Fort William, and Ernie Granzow, The Day Co., Minneapolis.

New Techniques in Sulfuring—Vince Blum, Omaha Elevator Co., Omaha.

Repair and Maintenance Programs—John T. Goetzinger, Rosenbaum Brothers, Omaha.

Spouting: I would like to see all machinery and equipment standardized as to loading spouts, etc., wouldn't you? —Robert M. Lare, Butler-Welsh Grain Co., Nebraska City, Neb.

New Equipment Found to Be of Value—Volunteers from the Floor.

Lighting Arrangements: Fluorescent, Vapor-proof globes, and Flood Lighting—Volunteers from the Floor.

Keep Your Eyes Open—During Friday's Quaker Oats Plant Tour—For—Herbert C. Brand.

THURSDAY EVENING

Committee Meetings—Nominations, Resolutions, New Membership, Name Change, Program for 1947, etc.

FRIDAY MORNING

Plant Inspection Trip—The Quaker Oats Co.

LUNCHEON

Courtesy The Quaker Oats Co., Mr. Arthur Poe, Manager.

Presiding: R. B. Pow, Reliance Grain Co., Ltd., Fort William.

Industrial Management—Mr. Arthur Poe, The Quaker Oats Co., Cedar Rapids.

Furfural: The Fascinating Story of the Manufacture and Use of Furfural from Oat Hulls—Dr. Henry P. Howells, Chief Chemist, The Quaker Oats Co. Laboratories, Cedar Rapids.

Presiding: John Belanger, Manitoba Pool Elevator, Ltd., Port Arthur.

The Importance of Variety in Marketing in Grains—Dr. John H. Parker, Director, Mid-West Barley Improvement Association, Milwaukee.

Identification of Barley Varieties by Kernel Characteristics—Dr. R. G. Shand, Agronomist and Barley Specialist of the U.S.D.A. and of the University of Wisconsin, Madison.

Plant Sanitation: Infestation Control, Including Where Old and New Stocks of Grain May Have to Be Held in Mixed Storage—Phillip E. DeVoe, Assistant Chief Chemist, The Quaker Oats Co., Cedar Rapids.

The Tools of the Scientist and How He Uses Them—Grover C. Meyer, Kansas City (Mo.) Power & Light Co.

Presiding: Robert R. Bredt, Fruen Milling Co., Minneapolis.

ROUND TABLE DISCUSSIONS

Barley and Malting—Discussion Leader—Lloyd E. Forsell, Albert Schwill & Co., Chicago; Discussion Committee—James Auld, Hales & Hunter Co., Minneapolis; C. Wallace Clark, Anheuser-Busch Co., Springfield, Mo.; Henry Bowman, G. J. Meyer Malt & Grain Corp., Buffalo; R. B. Pow, Reliance Grain Co., Ltd., Fort William; Ed. J. Raether, Brooks Elevator Corp., Minneapolis, and L. A. Hunt, Jos. F. Schlitz Brewing Co., Milwaukee.

Milling Wheat—Discussion Committee: Jesse F. Pugh, The Quaker Oats Company, St. Joseph, Mo.; O. Albin Halberg, Pillsbury Mills, Inc., Springfield, Ill.; Don MacDonald, Ogilvie Flour Mills Co., Ltd., Fort William; Ward Stanley, Standard Milling Co., Kansas City, Mo., and R. C. Bakke, Pillsbury Mills Inc., Minneapolis.

Soybeans, Flax and Linseed—Discussion Leader, H. L. Wilkins, Archer-Daniels-Midland Co., Minneapolis; Discussion Committee: Clifford C. Steiner, Central Soya Co., Decatur, Ind.; E. R. Anderson, Norris Grain Co., Chicago; Clifford A. MacIver, Archer-Daniels-Midland Co., Minneapolis; H. L. Heinrikson, Terminal Grain Corp., Sioux City, and Harry Hansen, The Glidden Co., Chicago.

Corn—Discussion Leader, Harold C. Wilber, A. E. Staley Mfg. Co., Decatur, Ill.; Vincent Blum, Omaha Elevator Co., Omaha; L. S. Hover, Thomson Grain Elevator Co., Louisville; Paul H. Christensen, Van Dusen-Harrington Co., Minneapolis; John T. Goetzinger, Rosenbaum Bros., Omaha, and Charles J. Winters, Public Grain Elevator, New Orleans.

Feed and Cereal Processing—Discussion Leader, Robert R. Bredt, Fruen Milling Co., Minneapolis; Discussion Committee: Fred Keeney, Allied Mills, Inc., Portsmouth, Va.; Howard Habegger, The McMillen Feed Mills, Inc., Marion, O.; Clare W. Cornelison, Minneapolis; Leonard Danielson, Arcady Farms Milling Co., Chicago, and Paul H. Naeher, B. F. Gump Co., Chicago.

FRIDAY EVENING

Dinner.

Presiding: Clifford A. MacIver, Archer-Daniels-Midland Co., Minneapolis.

"The Peacock Sheds His Tail," or "Here We Are, Where Are We?"—Grandon "Duke" Swanson, Assistant Executive Vice President, Grain & Feed Dealers National Association, St. Louis.

Colored Movies I took in New Orleans—R. B. Pow, Reliance Grain Co., Ltd., Fort William.

SATURDAY MORNING

Presiding: William H. Gassler, Rosenbaum Brothers, Chicago.

Car Unloading Panel Session—Chairman Harold C. Wilber, A. E. Staley Mfg. Co., Decatur, Ill.; Panel Members: H. L. Heinrikson, Terminal Grain Corp., Sioux City; Oscar W. Olsen, F. H. Peavey & Co., Duluth; Clarence C. Bach, Archer-Daniels-Midland Co., Minneapolis; Henry Bowman, G. J. Meyer Malt & Grain Co., Buffalo, and Leonard Danielson, Arcady Farms Milling Co., Chicago.

Automatic Shovel Experiments: Blueprints—Charles J. Winters, Public Grain Elevator, New Orleans.

Handling Grain By Air—Lewis Inks, The Quaker Oats Co., Akron.

Box Car Vacuum Clean-Up Experiments—Harry Hanson, The Glidden Co., Chicago.

A New Shovel Hook—Clare W. Cornelison, Minneapolis.

Presiding: Charles J. Winters, Public Grain Elevator, New Orleans.

Problems in Handling Rocky Mountain Grains—W. J. Hooper, Farmers Grain Cooperative, Ogden, Utah.

Every Super Should Have a Hobby—E. J. "Ted" Petranek, Plant Superintendent, The Quaker Oats Co., Cedar Rapids.

Problems of the Future Grain Elevator Superintendent—Claude L. Darbe, Simonds-Shields-Theis Grain Co., Kansas City, Mo.

You and Your Association—Ward Stanley, Standard Milling Co., Kansas City, Mo.

SATURDAY AFTERNOON

Presiding: Oscar W. Olsen, F. H. Peavey & Co., Duluth.

Incentives in Safety—Charles J. Winters, Public Grain Elevator, New Orleans.

Our Safety Contests—Oscar W. Olsen, SOGES Safety Contest Chairman, F. H. Peavey & Co., Duluth.

Award of SOGES Trophies to Safety Contest Winners—Oscar W. Olsen.

Latest Developments in Safety Guards on Old Equipment—Frank E. Carlson, Engineer, Underwriters Grain Association, Chicago.

Personnel Relations in the Post-War Era: Placing Returned Vets in the Industry—William B. Cormack, Personnel Director, The Quaker Oats Co., Cedar Rapids.

Presiding: Herbert C. Brand, The Quaker Oats Co., Cedar Rapids.

Highlights of Our Round Table Discussions—Summaries by Round Table Discussion Chairmen.

BUSINESS SESSION

Committee Reports.
Election of Honorary Members.
Old Business
New Business
Election of New Officers.
Adjournment
1946-47 Directors' Meeting.
1946-47 Committees Meetings.

ASSOCIATES' NIGHT

Reception.
Banquet.

Presiding: Grover C. Meyer, General Chairman, SOGES Associates Committee, Kansas City Power & Light Co., Kansas City, Mo.

Entertainment, Dancing, et al.

Ladies Program

THURSDAY MORNING

Ladies Registration.

Penick & Ford Luncheon, Elks' Club, Penick & Ford, Ltd. of Cedar Rapids, are widely known Corn and Molasses refiners and makers of My-T-Fine puddings. Among their well-known corn products are: corn starch, corn syrup, corn sugar, corn gluten meal, corn oil meal, corn gluten feed, corn oil, brewers' refined grits, etc. Brer Rabbit Molasses is their brand.

Tour of the Packaging Department of The Quaker Oats Co., largest cereal plant in the world, in charge of Miss Gertrude Stenner. The Quaker Oats Co., manufactures cereals, flour, feed, Aunt Jemima Pancake Flour, Ken-L-Ration Animal Foods, Muffets, Milk, Macaroni, Etc.

Tea in the Ladies Dining Room of The Quaker Oats Co. Plant.

The Place of Grains in the Diet—Mrs. Mary Schwimm, famous Chief Dietician, Home Economics Department, The Quaker Oats Co., Chicago.

FRIDAY

Ladies Registration for new arrivals.

Noon Luncheon, Cedar Rapids Country Club, courtesy of Mesdames Stephen W. and Tudor E. Wilder, Wilder Grain Co.; Ronald C. Booth, of Piper Grain & Milling Co., and Leland C. Miller, Federal-North Iowa Grain Co., of Cedar Rapids. Bachelor Jack D. Piper of Piper Grain & Milling Co.; will take personal charge of the transportation.

Cards—Table and Door Prizes courtesy of Mr. and Mrs. J. C. Kintz, of the J. C. Kintz Co., Cedar Rapids. Cards by courtesy of the Rock Island Lines.

Ladies Informal Reception, courtesy of Mr. and Mrs. Ben J. Many, B. J. Many Co., Inc., Chicago.

Ladies Dinner.

SATURDAY

This day has been set aside for shopping tours, drives through the city, trips through art galleries, museums, etc.

Social Hour—Courtesy of the Society of Grain Elevator Superintendents' Associate Membership.

Banquet—Corsages courtesy of Joe Kozak and Russell Maas of the Screw Conveyor Corporation, Hammond.

Entertainment, Dancing, Etc., courtesy of the SOGES. Associate Membership; General Chairman—Grover C. Meyer, Kansas City Power & Light Co., Kansas City, Mo.

THE 1944-46 OFFICERS AND DIRECTORS OF THE SUPERINTENDENTS' SOCIETY

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PREFER NEW NAME

Since my last letter to Emil Buelens, Robert Bredt of Fruen Milling Company, and his "Committee for the Selection, Submission, Discussion and Promulgation of a New Name for the Society of Grain Elevator Superintendents" have conducted a survey among the members of the Minneapolis Chapter to whom they have submitted 57 requests for opinions.

Twenty-eight replies were returned, all but four of which suggested new names for our organization. The four most popular names among these suggestions were submitted before one of our meetings and the choice of those who attended the meeting was: "Grain Handling & Processing Association."—Clifford A. MacIver, Archer - Daniels - Midland Company, Minneapolis.

Figure This

Mark two minus signs and one plus sign between the numbers below, without altering their numerical succession, and see if you can make all nine digits equal 100.

1 2 3 4 5 6 7 8 9=100

Preventing Dust Explosions

By W. DEAN KEEFER, Vice President,

Lumbermens Mutual Casualty Company, Chicago

A serious danger to employees and property in many grain handling and processing plants is the generation or use of substances which are liable to explode. This danger exists in so many plants that it is desirable for every executive to give some consideration to conditions in his own plant and to take steps to prevent an explosion before something happens to call this danger more forcibly to his attention.

An explosion is a rapid chemical decomposition of explosive material, or a rapid chemical reaction between two or more substances with explosive violence. The volume of gases resulting from explosion of dusts, flammable gases, or liquids is in most instances many times greater than the original volume of the exploded material.

The destruction following an explosion is due to the pressure developed, which in turn is due to the rapid increase in the temperature of the gases because of the chemical reaction, the propagation of flame following an explosion, and the resulting vacuum or low pressure area following an explosion.

Explosive substances may be divided into the following three general classes:

a. Explosive dusts, which may or may not contain some oxygen, but which do not contain enough oxygen for rapid combustion. They are explosive when suspended in the proper proportion of air.

b. Gases, vapors and flammable liquids which are explosive when mixed intimately and in certain proportions with air from which they obtain the oxygen necessary for rapid combustion. (Flammable liquids are not—properly speaking — explosive, but they are included in this classification because they give off explosive vapors.)

c. Commercial Explosives or Chemical Explosives which contain the oxygen necessary for their rapid combustion.

Dusts

Comparatively few persons realize that nearly all finely divided organic or metallic substances are liable to explode when mixed with air and when ignited. As a general rule, the finer the dust and the more complete its mixture with air, the greater is the danger of explosion. The following is a partial list of explosive dusts which will give some idea as to the great number of industries in which there is an explosion hazard:

Grain	Cork
Maize	Fine wood dust
Oat husks	Fertilizer
Malt	Charcoal
Sugar	Coal
Dextrin	Lampblack
Starch	Sulphur
Cocoa	Metallic dyes
Flour	Bronze
Spices	Iron
Coffee	Hemp
Rice milling	Oakum
Alfalfa	Powdered drugs
Wool	Aluminum
Flax	Antinmony
Cotton	Hard rubber
Celluloid	Powdered milk
Gum	Zinc
Leather	Magnesium
Paper	Soap powder
Tanning bark	Shellac

Ignition

In addition to the ignition methods described, dusts may be ignited if flint stones, nails, or bits of metal strike sparks when passing through places where dust is mixed with the air. Flint stones, nails, and pieces of iron or steel that accidentally become mixed with dust or dust-producing substances can be removed by screening or passing the material through a magnetic separator.

Where screw conveyors or bucket elevators are used, care should be exercised to prevent the moving parts from striking sparks on stationary objects.

It must be understood that dust will not explode spontaneously. Dust accumulations may ignite spontaneously, but this will not cause an explosion unless there is an explosive mixture of dust and air.

Sparks from static electricty are also an ignition cause. Another source of ignition that has been definitely determined following investigations of explosions in driers is the ignition of the dust from charred surfaces which have been in contact with hot surfaces such as steam pipes or coils.

Plant Design

In preventing dust explosions, it is of great importance to have the plant properly designed and constructed. Fire-resisting construction and detached annexes are desirable. The so-called "daylight" type of building, having a large area of window glass, has proved valuable in that the force of the explosion may be quickly relieved with proper precautions.

If plant annexes are not detached they should be separated by firewalls, the openings of which are protected by automatic fire-doors. Side walls of vertically corrugated metal sheeting or smooth concrete are better than brick or stone, for they offer no offsets for the accumulation of dusts.

Horizontal building members should be avoided as much as possible. Ledges, window sills, and all other surfaces that are horizontal or nearly so can be covered with inverted trough-like caps built at an angle of 45 degrees for the purpose of shedding dust. Numerous exits opening outward are also desirable.

To prevent dust accumulations in cracks between boards, they should be kept in good repair both to facilitate the removal of dust and to eliminate tripping hazards. Removable dust-tight covers are desirable for all pits and floor openings. Material falling into bins should be spouted so that it will not be possible for it to strike the side of the bin.

Ventilation

Preventing the formation of dust will, of course, solve the entire dust problem, but where this cannot or has not been done, the next most de-

sirable thing is to keep the dust from mixing with the air and to remove it by properly designed exhaust systems. Natural vents should be used wherever possible for all bins to exhaust the air being displaced by material entering the bin.

Plant Cleanliness

Various methods have been attempted for laying dust or otherwise rendering it harmless. None of these methods, however, is recommended, for their effectiveness is only temporary and nothing can take the place of dust removal. Vacuum cleaners have been proved successful in so many cases that their installation is becoming more and more common.

Wherever possible, machine guards and other pieces of equipment should not be closer than within 6 inches of the floor; this allows sufficient space for cleaning. Care should be exercised to keep as dry as possible all dust that is being stored. The highest order of housekeeping should prevail.

Grinding Mills and Crushers

Before grinding mills and crushers are shut down, it is advisable to run them empty. If this is not done, the dust accumulated in the grinder may ignite spontaneously and cause an explosion when the machine is started up again.

Inert gases are effective for the prevention of flame propagation in grinding operation. Several industries have already installed inert gas units for the reduction of the explosion hazard in connection with pulverizing operations.

Conveyors and Elevators

Conveyors and ducts that are used to handle dusts should be dust-tight. Some suggest that the installation of revolving dampers in grain gravity conveyors will prevent the passage of flame through the conveyor.

Elevator should be enclosed in dust-tight casings. It is considered safer to enclose each leg separately. It is advisable to vent to the outside atmosphere all conveyors and elevators so that in case there is an explosion inside any conveyor or leg, the resulting damage will be localized as much as possible.

If conveyors are used to carry material from one building to another, choke conveyors should be used. The advantage of this type of conveyor is that a section can be removed in order that the material may pack in solid form, so that flame propagation is prevented.

Automatic fire alarms which sound when journals and bearings are overheated are desirable.

Dust Storage

Dust storage should be separate and as far removed as practicable from buildings in which it is collected. It seems to be generally agreed that dust should not be stored in large quantities for any length of time on account of the danger of spontaneous ignition. Large quantities of dust also increase the damage from any fire or explosion that may occur.

The size of dust storage bins and tanks should be as small as is consistent with efficient operation. Their construction should preferably be of incombustible material. Vent pipes should be installed and carried to a point above the roof to guarantee against any pressure accumulation inside the bin. Moisture in dust accumulations may hasten spontaneous ignition. . . .

Gases, Vapors, and Flammable Liquids

So many new developments are being made in grain processing that it

is impossible to give a complete list of the gases, vapors, and flammable liquids that might cause explosions. Moreover, it is difficult to classify many substances as either flammable or explosive, for under some conditions certain substances may not even burn; on the other hand, if conditions are just right they might burn slowly, and again, under other conditions, an explosion might occur. The following lists, however, give a number of the most common gases, vapors, and flammable liquids that are liable to cause an explosion:

EXPLOSIVE GASES

Acetylene
Carbon monoxide
Ethylene
Hydrogen
Illuminating gas
Natural gas
Miscellaneous commercial gases

FLAMMABLE LIQUIDS

Class 1—Liquids in this class have a flash point below 25 degrees F., closed cup tester.

Ether
Carbon bisulphide
Gasoline
Naptha
Benzol
Collodion
Liquefied petroleum gas
Acetone

Class 2—Liquids in this class have a flash point above 25 degrees F., and below 70 degrees F., closed cup tester.

Alcohol
Amyl acetate
Toluol
Ethyl acetate
Methyl acetate

Class 3—Liquids in this class have a flash point above 70 degrees F., and below 187 degrees F., closed cup tester.

Kerosene
Amyl alcohol
Turpentine
Fuel oil

Other flammable liquids given in the following list should be included in the above classifications according to their flash points:

Paints
Varnishes
Polishing solutions
Dryers
Cleaning solutions
Illuminating oils
Petroleum

Ignition

The precautions that must be considered in preventing explosions are to prevent the formation of an explosive mixture and to prevent the ignition or "setting off" of the explosive mixture. Explosive gases and vapors, and vapors from flammable liquids may be ignited in any one of four ways; by spontaneous ignition (often spoken of as "spontaneous combustion") of near-by substances, or by the generation or application of a spark, excessive heat, or a flame.

Spontaneous Ignition

Spontaneous ignition is the result of a chemical reaction between the oxygen of the air and the material ignited, or bacteriological action, or both. As in most chemical reactions, heat is produced. The heat causes the action to become more rapid until the point is reached at which the material bursts into flames; the flames, in turn, might cause an explosion.

Spontaneous ignition, especially in oily rags and dusts, has undoubtedly caused some gases, vapors, and dusts to explode; but many disasters have been attributed to spontaneous ignition when, if the truth were known, they may have been caused by a flame, a spark, or excessive heat.

Sparks

Every precaution should be observed to avoid static electrical sparks. On power transmission belts this may be accomplished by applying brushes on the metal pulleys over which the belt runs. Wherever there is an explosion hazard both the moving and stationary parts of all machinery should be electrically grounded.

The violent rubbing of or friction between two dissimilar substances may generate static electrical sparks and ignite explosive substances.

In making repairs to piping systems, wire jumpers should be used when disconnecting unions and right and left-hand couplings, and when cutting pipe. The jumper should be connected to the piping on each side of the place to be disconnected to prevent sparking in case the pipe is accidentally charged with electric current. This applies especially to underground piping when grounded electric current may be present.

Dangerous sparks often result from striking together two pieces of metal, or from nails in shoes striking on nails in floors, or on metal-covered, stone, or concrete floors. It is often desirable to have workmen wear rubber-soled shoes. For the same reason, some employers use rubber, fibre, or other non-sparking material for wheel treads on trucks and conveyors.

Electrical Equipment

Natural light through windows and skylights should be used whenever possible. If artificial illumination must be provided in locations where there is an explosion hazard, keyless sockets should be used, which, together with the electric lamps, should be enclosed in vapor-proof globes protected by wire cages, supported on pipe hangers and wired with approved insulated wire. Wire joints should be soldered and taped. The use of attachment plugs, separate connectors, and other devices liable to create sparks should be avoided.

It is advisable to place all wires in threaded conduit which can be sealed and made air-tight. Switches, cut-outs, and other pieces of electrical equipment should preferably be enclosed in vapor-proof casings or cabinets, so arranged that they can be operated without exposing any of the current-carrying parts.

Extension cords should not be used unless absolutely necessary, and then only theater cable or cord protected with spark-proof armored cable should be used. This should be fitted with keyless sockets, vapor-proof globes, and heavy wire cage guards. Extension cords should never be lowered into tanks or vats to determine the level of the contents; a weighted tape will serve just as well and be much safer. Incidentally there is only one approved Class 2 Group G lamp on the market.

Heat

Overheated bearings can ignite substances that are flammable or explosive. Bearings should, therefore, have the best of care, inspection and lubrication. Where roller bearings are not used, it is advisable to install sealed bearings of the self-oiling type.

Friction of belts is likely to start a fire and thereby cause an explosion. Belts should not be permitted to rub against each other or against other objects. Neither should they be allowed to slip around pulleys which, because of choke-up, excessive load, or other causes, will not revolve.

Care should be exercised to prevent the sun from shining through defective window glass, bottles, or other articles of glass which might act as a lens and start a fire. Bottles and other articles can be set out of the range of the sun and the windows can be shaded or painted. The carrying of glass lenses by workmen should be prohibited in plants where there is an explosion hazard.

Oil House

Where large storage tanks are not installed, containers such as drums, barrels, and cans should be stored in oil houses or other suitable places. The oil house should preferably be a separate, detached building of fire-

resisting construction. Containers should not be placed upon wooden racks, but upon the cement floor, or upon concrete, metal, or other fire-resisting frames, racks, or shelves. Drums, barrels, and other containers should have the caps, plugs or bungs closed at all times except when in actual use. Empty containers should always be kept closed.

Flame

Many explosions have been caused by smoking and the throwing aside of lighted matches, cigars, pipe ashes, and cigarettes. Smoking, and the lighting or carrying of matches, cigar lighters, and other flame-producing articles, should be prohibited in every plant where explosive substances are used, stored, or generated. Some employers even search all workmen and discharge any one detected with such articles in his possession. Such a search may be most effective if conducted at least twice a week and at irregular times of the day.

In locations where the danger of an explosive is especially great, it might be advisable to provide special clothing for men to wear when at work—this clothing being made entirely without pockets. To prevent other possibilities of sparks, neither iron nor steel buttons, nor other metal attachments should be allowed on work-clothes, nor should metal objects, such as knives and keys, be carried by the men.

Open Flames. The use of open flames, such as lanterns, gas jets, oil lamps, torches, or candles, should not be permitted in plants. Neither should boilers, furnaces, or dryers be installed near explosive gases, vapors, or flammable liquids. Gases and vapors may be carried by drafts to a flame several hundred feet away. Heavy vapors may spread across a floor to a flame and may flash back and cause an explosion at the point at which the gas or vapor originated. Boilers and other fires should be in a separate building and out of the line in which explosive gases and vapors might travel or be blown.

CYANIDE KILLS FUMIGATOR

John Kistner 40, a representative of the Industrial Fumigant Co., was found dead in a basement warehouse of the Western Milling Co., Pendleton, Ore., Jan. 29, where he was using cyanide gas to fumigate. The head of this same fumigation concern was recently killed in Minneapolis, where he had been using another toxic fumigant in a mill.

Magnetic Separators

By GILBERT P. LANE, Plant Manager

Arcady Farms Milling Company, Chicago

FOR the past ten years, and particularly the hectic war years, an abnormal number of grain plants have exploded and, if of wood construction, burned to the ground in the largest and most spectacular blazes of their kind within recollection.

The exact causes of these disasters have never been determined. Several theories, however, have been advanced. It has been suggested that a spark or static arc may have been the cause. Another theory is that tramp iron entered the plant. And a third belief on the part of some is that a careless workman somewhere in the plant had been responsible.

After a disastrous dust explosion and leveling fire, one large Chicago terminal installed a car dumper in the new house. This is on a railroad siding, and is quite an ingenious mechanism.

The dumper is housed in a large shed, and one full box car at a time is spotted thereon. The car is then anchored and tilted sideways as well as end to end, the entire load of grain spilling out of the side door down into a pit and on to a three feet wide conveyor belt, which travels at a speed of over 800 ft. per minute.

And Sale of Tramp Iron Is Profitable

OVER this belt, an especially built 3x5x2 foot rectangular magnet is installed, where it removes even greater amounts of tramp iron than originally anticipated. The miscellaneous assortment of iron removed consists of everything from nails up to railroad brake shoes, totalling many pounds per day.

It is not hard to realize that such an amount of iron might well be responsible for many of the disastrous dust explosions and fires occurring constantly in grain handling and processing plants.

In talking to Mr. Kent Parker, of the Western Actuarial Bureau, who is, incidentally, on a N.F.P.A. committee for the prevention of dust explosions, I found he was much impressed with the effectiveness of this special magnet and amazed at the amount of tramp iron that was coming in with the grain—particularly when one considers that much of this must have passed through other terminals, sub-terminals, and/or country elevators.

During the slowest week last year, well over 40,000 cars of grain and grain products were shipped by rail, or an equivalent of 70,000,000 bushels per week. The 3,100 larger terminal, sub-terminal and processing plants in this country represent over one billion bushels of storage capacity. This figure does not include the small country elevators, small feed and flour mills, etc., but does include storage facilities for cereal, soybean, linseed, starch and malt plants, etc.

But Infinitesimal in Cost

IN this group of larger industrial grain plants, the smallest in size (feed) have an average capacity in

the neighborhood of 100,000 bushels. I estimate, based upon today's replacement figures, that even a small subterminal alone, of permanent and proper construction, represents an investment of better than $100,000, and from there investment in plant facilities runs into millions of dollars per unit.

The point I'm getting at is that certainly even small plants are well able to afford magnetic separators considering the investment they have at stake. Nevertheless there should be a definitely good demand for separators in the terminal and sub-terminal grain handling and grain processing industry, and, as far as I know, this demand has not been exploited to any extent, if at all.

I feel we owe it to our companies, our employees, and to ourselves to keep ahead of the "explosion parade," and to leave no stone unturned in preventive measures taken—particularly when a few thousand dollars would guarantee that there would be no sparks originating in our plants from tramp metal. The next step is action!

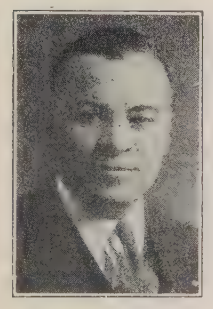
PERMANENT MAGNETS GET NFPA OKAY

Following the Jan. 29th meeting of the Dust Explosion Hazards Committee of the National Fire Protection Association in New York, Chairman Hylton R. Brown of the U. S. Bureau of Mines announced that all dust explosion codes would be amended to permit the use of approved permanent magnets as well as electro-magnetic and pneumatic separators.

OUR SOGES SAFETY EFFORTS

By OSCAR W. OLSEN, F. H. Peavey & Company, Duluth, Chairman, SOGES Safety Contest

As individuals we have probably all done a good deal for accident prevention during 1944, but as a group we have accomplished few of the objectives which we outlined in 1943. The main reason is that we have been so busy with the countless problems brought about by trying to operate during war-time conditions with new help and short crews.



As a matter of fact, even at this late date, we do not have all the accident scores from the Superintendents who entered the 1944 SOGES Safety Contest. Therefore, I wish to make this one last plea that they send these figures at once to Dean Clark so that we can make the usual reports and summaries.

Even if your record was not very good do not be ashamed of it, as we were nearly all in the same boat, and the data we have already received indicates quite an increase in accident frequency.

Now that the war is over perhaps we can soon begin to make plans for accident prevention campaigns, not only for our plants but also for the industry as a whole. Something has already been done along that line through the SOGES representatives who are on the Food Section safety committee. When they can all meet together again I am sure that they will have some good suggestions for us all. As they will probably meet again in October, I will not comment on their work in detail, as we may be able to make a more complete report after that meeting.

Our own SOGES program has been more or less dormant for the reasons outlined above, but the following matters will be given attention as soon as conditions permit:

1. "Study Course"—The material for the Study Course for Foremen has been in the Secretary's office for several months, but there has been a delay in printing this due to the lack of funds for the purpose.

If funds cannot be obtained for this purpose it is my suggestion that it be mimeographed and distributed to the members. If necessary a small charge can be made for each copy. Your committee feels that this data is valuable and it should be put into the best possible use as soon as possible by each Superintendent.

2. Beginning at the first of the year 1945 "GRAIN" has been printing our Daily Safety Reminders—one month at a time. We are anxious to know what use the Superintendents are making of this material?

It is suitable for a daily message on the bulletin board, or for weekly reminders such as pay-roll inserts, for discussion at plant safety meetings, etc. A similar set is available for 1946, and if anyone desires advance copies we will be glad to send them a mimeographed set. We also have available similar sets for truck fleets stressing driving hazards.

3. I am very anxious to have an expression from the Superintendents as to a continuation of our Safety Contests. There was not much response in 1945, but I feel that with conditions returning somewhat to normal we should resume all activities which will tend to cut down our accident frequency, which is now abnormally high.

4. Let us know your needs as far as safety material is concerned. Posters, bulletins, and detailed data, can be obtained for you, on practically any subject.

APPROVES SAFETY EFFORT

Mr. J. A. Mull of Van Dusen-Harrington Company, Minneapolis, Chairman of our Insurance Committee, is of the opinion that the Society of Grain Elevator Superintendents has been doing good work with Elevator Superintendents and that Society is in position to do more good work in promoting safety measures in grain elevators.

We are hopeful that this good work will continue, as without doubt it is very helpful.—H. M. Stratton, Stratton Grain Company, President, The Terminal Elevator Grain Merchants Association, Milwaukee.

Says It's "Swell"

You have one swell magazine.—Frank J. Kohout, A. C. Horn Company, Minneapolis.

Safety Study Course

Chapter Two, by CLARENCE W. TURNING

The following Chapter concerns itself particularly with the place of the Foreman in the Safety Program. Like further material to be presented, it readily lends itself to expansion for emphasis upon phases of the safety training that seem particularly necessary in light of past experiences both in individual as well as kindred plants. [*Save this chapter for your permanent files.*]

Lesson No. 3—"Foremanship"

To every workman, remember this, the Foreman is your friend. In explanation we will add that our business is more than the elevator, the processing departments, the mill and warehouse buildings, or the loading dock. It is more than a place where men put in their daily 8-hour shift. It is more than the production plant of a large grain or processing concern. It is your opportunity to make a success of yourself.

Standing squarely behind you, ready to help you at all times, is your Department Foreman. Our Supervisors are men well qualified for foremanship by years of experience and training.

Your Foreman takes an active, vital interest in the men of his department. He is concerned with your welfare and is anxious to see you succeed. Go to him freely. Your problems are his problems. Your Foreman is your friend.

All employees are charged to keep Safety foremost in their minds, but the person immediately directing work has a special responsibility to give specific instructions relating to Safety and to watch that there is no infractions of his instructions nor of Safety Rules.

"One of the strongest arguments for enforcing safety rules is that it saves lives."

The Foreman

(To be discussed at Foremen's meetings only)

"Supervision would be better understood if we spelled it Super-Vision. Let us so supervise, that disaster which intelligence might anticipate, will not occur."

The following is an extract from the booklet: "The Foreman," issued by the National Association of Manufacturers, 14 W. 49 St., New York. (Single copies free, quantities at cost):

The Foreman's authority should be commensurate with responsibility.

1. In the performance of their jobs Foremen require authority consistent with their responsibilities. It is desirable that each Foreman have a clear realization of his duties and responsibilities and the extent to which he may exercise authority:

This objective may be achieved by the division of the Foreman's responsibilities and functions into these three classes:

(A) Those functions on which he may exercise full authority without consultation with his superior,

(B) Those functions on which he may report the action taken to his superior, and

(C) Those functions on which he may not exercise full authority, but may, instead, make a recommendation for action which must receive his superior's approval before being put into effect.

2. The Foreman should have the right to approve applicants for employment whose work he must supervise; should have the right to advocate discharge of employes, and should be held responsible for the maintenance of satisfactory employment relations to the group which he supervises.

3. The Foreman should normally be the first contact for workers who have grievances they wish to discuss.

4. If it is necessary for executive management to reverse the decisions of Foremen, this should, whenever possible, be done by encouraging the Foreman to make the reversal himself, thus preserving his prestige.

It follows therefore, that Foremen must have the opportunity of acquiring a thorough knowledge of management's viewpoint and of developing confidence therein so that they in turn may exercise the leadership essential to fulfillment of their duties as (1) supervisors of production, (2) and management's employment relations representatives.

The Foreman

"Help the new man: Gain his confidence; teach him, impress him, and supervise him."

(For use at all meetings):

The Foreman should take responsibility for these prime requisites for a successful safety program:

1. To find job hazards, check the work area, the material handled, the machines, the tools and the clothing.

2. The Foreman should learn to spot the hazards on each job, to pass the information on to the workers about these hazards and how to keep them from turning into injuries.

3. When the hazards have been found, remove the hazard, protect the worker against the hazard, or develop a safe practice to avoid injury from the hazard.

It's You

"If you want to work for the kind of firm
Like the kind of firm you like,
You needn't slip your clothes in a grip
And start on a long, long hike.

You'll only find what you left behind
For there's nothing that's really new.
It's a knock at yourself when you knock your firm;
It isn't your firm — it's you.

"Good firms are not made by men afraid
Lest someone else gets ahead.
When everyone works and nobody shirks,
You can raise a firm from the dead.

And if, while you make your personal stake,
Your neighbor can make one, too,
Your firm will be what you want it to be—
It isn't your firm — it's you!!"

—Ken Roberts in National Supply Co. *News*.

No walk . . . no wait . . . no waste

with SEEDBURO INTER-COMMUNICATION SYSTEMS

Save Time—You can talk to any key man in your plant without leaving your desk . . . when you install a Seedburo Inter-Communication System. It is not necessary for your men to leave their work. You can give instructions, ask questions, and get information with no loss of time. It's the modern way to get things done with a minimum of effort, errors and interruptions.

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Let us help you select proper equipment to meet your requirements. No inter-communication problem is too large for our engineering department. Our line is complete. Tell us your problem and we will make recommendations without charge.

A COMPLETE STOCK OF EQUIPMENT AND SUPPLIES Seedburo products are well known. There are over 400 different items of Equipment and Supplies . . . used in testing and handling grain, seed, beans, flour, coffee, tobacco, sugar, soap, starch and others. All merchandise fully guaranteed. Write today for your copy of Seedburo Catalog and Reference Book.

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Recommended for businesses that require simple installations. You may start with one Master Station and one Sub-Station. Priced from $55.00 and up. Write for circular giving complete information.

FLASH-A-CALL

This system furnishes much greater volume. It is particularly adaptable for larger plants and gives instant, complete plant coverage. It. is today's most complete, most practical system. Prices range from $57.75 and up.

SEEDBURO EQUIPMENT COMPANY

626 BROOKS BUILDING • CHICAGO 6, ILLINOIS

NEW ENID TERMINAL EMBODIES UNIQUE IDEAS

On this month's front cover is an artist's drawing of how the new multi-million-bushel terminal elevator for the Union Equity Co-operative Exchange at Enid will look upon completion.

"In order to help you better understand our enthusiasm for the hexagon shape bins," writes Manager E. N. Puckett, "we would like to give you our thoughts on this new type of construction, namely:

"1. The hexagon shape walls are much stronger both from within and without the walls.

"2. We are able to construct grain elevators in rows of the multiples of three, such as three, six, nine, or twelve, with all of the walls lengthwise running at an angling position and very few crosswise walls running straight, which, from an engineering standpoint, eliminates the danger of expansion and contraction.

"3. By so constructing these grain bins we can have all of them the same capacity.

"4. By reason of the fact that each of the 1,224 walls in this structure, with the exception of the outside walls, performs an equal double function, far less cubic yards of material are required for the same capacity than any other form of construction. From the information we gather, this is the first grain elevator of this same design ever to be undertaken.

"5. It has been conceded by most superintendents and grain folks that have had experience that the smaller the distance across the bin the safer it is for keeping the grain in condition by reason of the fact that it puts the wheat on the walls at a much shorter distance than where the bins are of greater diameters. For an example, in most of the center type construction the bins are from 21 to 32 feet across. In our type of construction these particular bins, with 9-foot centers from pilaster to pilaster, are 15 feet across.

"6. By reason of the fact that these bins are 15 feet across in place of 21 to 32 feet, it requires about one-half of the hoppering material that is required in the larger bins. Naturally we have grain capacity in the place of hoppering, both in the bottom and the top.

"7. With all of the old type grain elevators two rows of bins are about all you can get each conveyor belt to take care of. This is true both in the gallery and in the basement. With our type of construction the tripper in the gallery will serve three rows of bins, all direct, without any extra spouting, and each belt in the basement will likewise draw from three rows of bins direct to the belt."

CORN GRIND OFF

During February the 11 refiners of corn ground only 5,698,841 bu. for domestic consumption, due to shortages.

"GRAIN"

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LOADINGS UP 22%

Carloadings of grain and grain products during the current period show an increase of 22% over the same cumulative period of 1945, but are 2% below the corresponding figures of 1944, and for the following weeks, were:

	1946	1945	1944
Feb. 16..	51,843	43,026	50,737
Feb. 23..	51,720	40,465	48,084
Mar. 2..	54,912	41,281	48,281
Mar. 9..	47,160	40,650	45,506

314 MILLS GRIND 94% OF FLOUR

During December, 1,052 mills ground 52,974,075 bu. wheat, compared with 52,402,665 bu. ground by 1,046 mills during November, and 46,485,337 bu. ground by 1,020 mills a year previous.

Of this total 314 mills with 801 sacks daily capacity or more ground 49,761,983 bu., or 93.9% of the total, of which 238 mills with 1,201 sacks daily capacity or more ground 46,683,546 bu., or 88.1% of the total.

PROOF ENOUGH

"I'm sure my husband isn't faithful to me," an Irish woman remarked. "Not one of the children look like him."

Weevil-Cide SPLITTERS

LOT OF HOT AIR

First Farmer—Quite a wind we had last night.

Second Farmer—Yes, 'twas.

First Farmer—Was your barn damaged much?

Second Farmer—Don't know. Haven't found it yet!

* * *

HE COULD TELL

"I see you are no gentleman," hissed the young woman on the street corner at the man who laughed as the wind swept her skirts up pretty high.

"No," he replied gently, "and I see you aren't either."

* * *

DARN IT!

Willie: "Paw, what is discretion?"

Father: "It's something, son, that comes to a man after he's too old for it to do him any good."

* * *

PERSISTENCE

The tired grain man had just ordered 500 gallons of grain fumigant. He turned to the smiling salesman and said: "Young man, you may well feel proud of yourself. I've refused to see five fumigant salesmen this week."

"I know," said the salesman. "I'm them."

* * *

CHRISTMAS EVERY DAY

Most gals got Santa beat all hollow when it comes to filling stockings.

NEVER THE SAME

The tramp knocked on the door and asked the housewife for something to eat. The lady looked at him very closely and said:

"Aren't you the same man I gave some pancakes to not long ago?"

"No," replied the tramp, "and the doctor says I never will be."

* * *

REAL SATISFACTION

A patent medicine manufacturing company received the following letter from a satisfied customer:

"I am very much pleased with your remedy. I had a wart on my chest, and after using six bottles of your medicine, it moved to my neck, and now I use it for a collar button."

* * *

LUCKY, NO MARTINIS

She was so thin that when she drank tomato juice she looked like a thermometer.

* * *

AND BLOWS NOBODY GOOD?

Saxophone: An ill wind that nobody blows good.

Last nite I held a little hand
So dainty and so sweet
I thought my heart would surely break
So wildly did it beat.
No other hand in all the world
Can greater solace bring
Than the sweet hand I held last nite
Four aces and a king.

AND THANKFUL, TOO

"Why do men have hair on their chests?"

"Well, they can't have everything."

* * *

OR A RIOT

A shoulder strap is what keeps an attraction from becoming a sensation.

* * *

SOME LOOK IT

Mrs. Brown: "Whenever I'm in the dumps, I get myself a new hat."

Mrs. Jones: "I was wondering where you got them."

* * *

NEEDED GLASSES?

Ed: "Yesterday I told my girl her stockings were sagging and she slapped me."

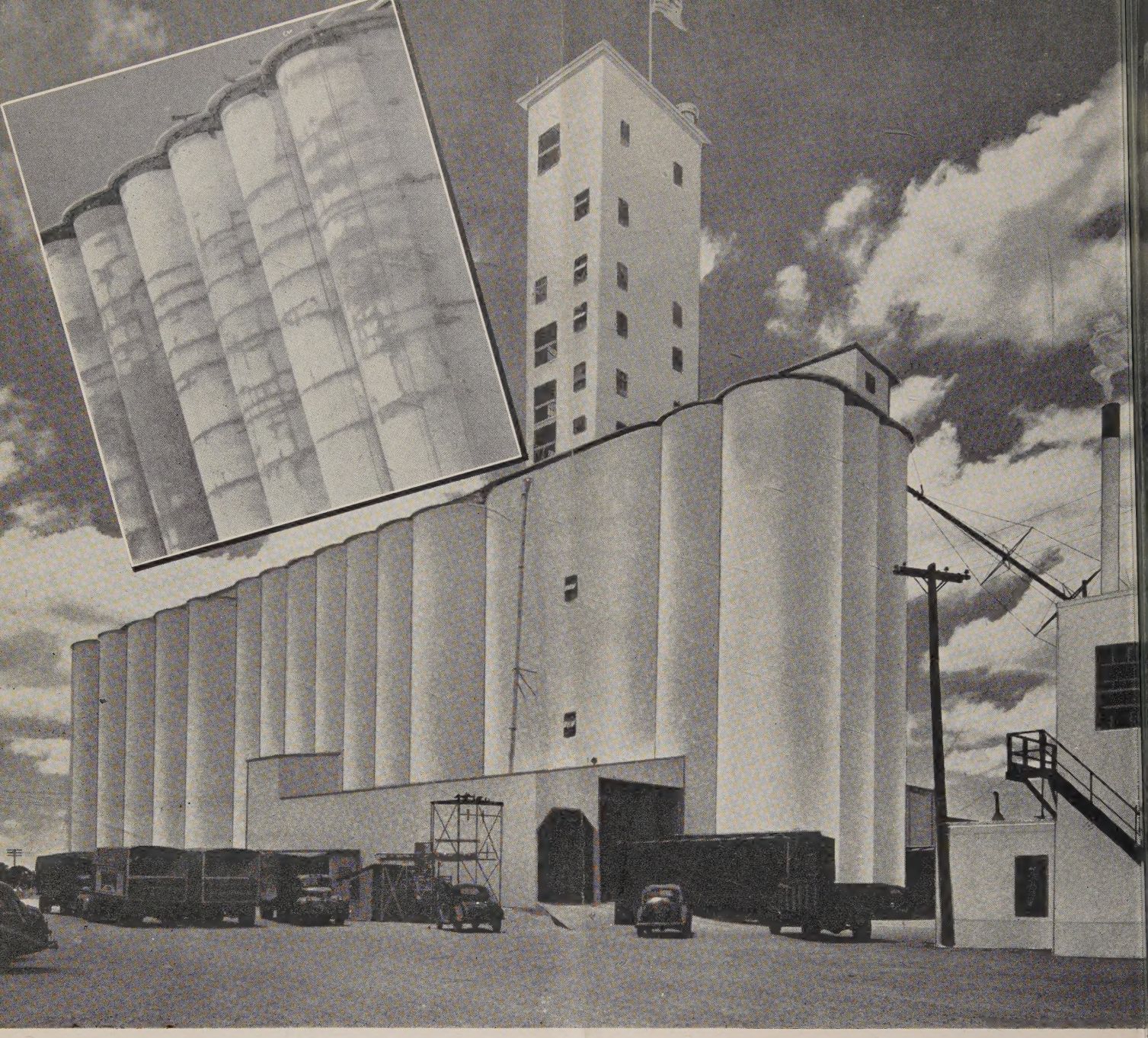
Ted: "Why?"

Ed: "She didn't have any on."

WHAT DOES HE MEAN "KICK"

A prominent attorney met a woman client on the street. She was leading a tiny French poodle on a leash. As the two talked over a business matter the dog became attracted to the attorney's shoes. Suddenly the attorney stepped aside in alarm. The woman looked at him, smiled and said: "Oh, don't be alarmed, he won't bite."

"I'm not afraid of his biting me," the attorney replied, "but I saw him raise his leg and I was afraid he was going to kick me."



INSERT: Close-up view of the tanks after chipping away bad concrete and caulking.

ANOTHER SURFACITE Weatherproofing Contract Awarded to John D. Bolton & Company—Your Reliable Waterproofing expert.

Perhaps our reputation is spreading. We hope it is. If so, it is only because our good friends and satisfied customers recommend our work to others.

We did our best — as we always do — for Mr. Gaylord Stone of the Universal Mills of Fort Worth, Texas, whose plant is pictured above. Will you add his name to the long list of those who heartily endorse the meticulous and experienced work skillfully performed by . . .

JOHN D. BOLTON & COMPANY

20 NORTH WACKER DRIVE GUNITE CONTRACTORS CHICAGO 6, ILLINOIS